15(4)

S/183/59/000/06/015/027
B004/B007

AUTHORS: Berestnev, V. A., Gatovskaya, T. V., Kargin, V. A., Yaminskaya, Ye. Ya.

TITLE: The Mechanism of the Fatigue of Fibers

PERIODICAL: Khimicheskiy volokna, 1959, Nr 6, pp 50 - 52 (USSR)

ABSTRACT: The authors proceed from the experimentally proven fact that the destruction of fibers by fatigue is caused by macrodefects (Refs 5-8), which develop in the course of the fatigue tests in the fiber. In the present paper they endeavor to give a mathematical description of this process as a function $n = f(N, v)$ (n = number of stress changes leading to fatigue failure, N = number of occurring defects, v = rate of the increase of defects). In consideration of the duration of stress, the intensity of the frequency of stress changes, and the length of the specimen to be tested, the authors obtain the equation (9), the correctness of which they prove for various limiting cases and which they compare with the results obtained by N. P. Nosov (Fig) (Ref [illegible]). They mention

Card 1/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

SOLNIMSKY, G.L., professor; BERESTNEV, V.A.

Regarding the concepts of the strength of polymer materials. Khim. nauka i prom. 4 no.4:543-544 '59. (MIRA 13:8)
(Polymers) (Strength of materials)

ORLOVA, A.V.; BERESTNEV, V.A.; KARGIN, V.A.

Disintegration of fibers due to mechanical action. Vysokom.soed. 1 no.5:740-742 My '59. (MIRA 12:10)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Textile fibers, Synthetic)

SLONIMSKIY, G.L.; BERESTNEV, V.A.

Discussing the problem of the strength of polymer materials.
Vysokom. soed. 1 no.3:485-486 Mr '59. (MIRA 12:10)
(Polymers--Congresses)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTNEV, V.A.; GATOVSKAYA, T.V.; KARGIN, V.A.; YAMINSKAYA, Ye.Ya.

Study of the physicochemical properties of cord fibers. Part 3: Some changes in the structure of fibers occurring in repeated cyclic stretching. Vysokom. soed. 1 no.3:373-377 Mr '59.
(MIRA 12:10)

1. Fiziko-khimicheskiy institut im. L.Ya. Karpova i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Nylon--Testing)

BERESTNEV, V.A.; GATOVSKAYA, T.V.; KARGIN, V.A.; YAMINSKAYA, Ye.Ya.

Study of the physicochemical properties of cord fibers.
Part 2: Effect of thermal and mechanical action on the sorption properties of capron cord. Vysokom. soed. 1 no.3:337-341 Mr '59.
(MIRA 12:10)

1.Fiziko-khimicheskiy institut im. L.Ya. Karpova i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Nylon)

On the Mechanism of Fiber Failure SOV/20-122-4-36/57

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-Chemical Institute imeni L. Ya. Karpov)
Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire-Industry)

SUBMITTED: June 24, 1958

Card 4/4

acid solution are given in table 2. It is seen from this that the decrease in viscosity of solutions from fibers, which have been torn on the dynamometer, is considerably higher than with a repeated extension. During fatigue the viscosity value falls somewhat in the initial period and then remains stable even at breaking. Inversely, at breaking on the dynamometer the specific viscosity is maintained up to the destruction of the fiber. At the time and on the site of breaking only, it drops rapidly. Therefore, it might be supposed that the destruction of a fiber in consequence of repeated mechanical influence is due to the continuous development of macrodefects at depth. During this, only a few chains are broken in a small cross section; during a single extension, the breaking of a considerable number of molecular chains in a weak part of the fiber determines the destruction of the fiber. There are 2 tables and 2 references, 2 of which are Soviet.

On the Mechanism of Fiber Failure

SOV/20-122-4-36/57

damaged spots of the fiber. Thus, the macrodefects were able to expand (Ref 2). This is confirmed by table 1. Washing out of the cord by means of carbon tetrachloride for the removal of the oleic acid increases the solidity of the fiber (Table 1, Sample 3). Table 1 gives further evidence on the stability and stretch (up to fatigue) of the investigated samples. These data remain unchanged, without dependence upon the kind of treatment of the fiber. Thus, with destruction of the cord by a repeated and single type of influence, different factors play the important role. In the first case the macro defects are mainly responsible, whereas during just one operation (tension test on a dynamometer) the effect of these factors is not large. Possibly, in this case the destruction of the cord is substantially related to the simultaneous destruction of a large number of molecular chains in the weakest places of the fiber. In order to confirm this assumption the viscosity of the fiber solutions before and after the mechanical treatment (repeated cyclic extension and breaking on the dynamometer) was measured. The results of the characteristic viscosity of these solutions in an 85 % formic

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SOV/69-20-6-3/15

Studies of the Physical-Chemical Properties of Cord Fibers. 1. The Heat Effects of Dissolution of Capron Fibers

ASSOCIATIONS: Fiziko-khimicheskiy institut imeni L.Ya. Karpova (Institute of Physics and Chemistry imeni L.Ya. Karpov). Nauchno-issledovatel'skiy institut shinnoy promyshlennosti, Moskva (Scientific Research Institute of the Tire Industry, Moscow)

SUBMITTED: October 5, 1957

1. Capron fibers--Physical properties 2. Capron fibers--Chemical properties 3. Capron fibers--Test methods 4. Capron fibers --Temperature factors

Card 2/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

SOV/69-20-6-3/15

AUTHORS: Berestnev, V.A., Gatovskaya, T.V., Kargin, V.A., Yaminskaya, Ye.Ya.

TITLE: Studies of the Physical-Chemical Properties of Cord Fibers (Izucheniye fiziko-khimicheskikh svoystv kordnykh volokon). 1. The Heat Effects of Dissolution of Capron Fibers (Teplovyye effekty rastvoreniya kapronovogo volokna)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol 20, Nr 6, pp 694-696 (USSR)

ABSTRACT: The microstructure of cord fibers and their changes have been investigated by thermodynamical methods. The table shows that the decrease in heat effects during heating in water is different for stretched and unstretched specimens. The difference is 0.77 kcal/g or 25% of the total heat effect. The dissolution heat decreases sharply during heating of capron fibers in formic acid which is explained by an increase in crystallinity of the polymer. Repeated stretching has no effect on the heat of dissolution. The dissolution heat of a rolled specimen is 24.5% higher than in initial specimens. Cord fatigue is due to macrodefects in the fiber. There is 1 set of photos, 1 table, and 4 Soviet references.

Berestnev, V. A.

6

4E7c (y)

2 May

The effect of the intermolecular interaction on the ... [illegible]

[illegible]

L 17318-63 BDS

ACCESSION NR: AP3004949 S/0108/63/018/008/0031/0035

AUTHOR: Akchurin, E. A.; Berestnev, P. D.

49

TITLE: Tunnel-diode superregenerative amplifier

SOURCE: Radiotekhnika, v. 18, no. 8, 1963, 31-35

TOPIC TAGS: tunnel diode, amplifier, superregenerative amplifier, quenching-frequency oscillator

ABSTRACT: Using tunnel diodes instead of transistors permits operating a small-size high-gain amplifier at temperatures up to 300 C. A quenching-frequency oscillator and a regenerator designed with tunnel diodes are considered theoretically. Six calculated parameters, including quenching voltage, signal-circuit voltage, and equivalent capacitance, show good agreement with experimental results (table supplied). Orig. art. has: 4 figures, 22 formulas, and 1 table.

Card 1/1

SOV/108-13-2-5/15

Conditions for Oscillation and Frequency of Oscillations of Junction-type Triode Transistor Oscillators

with transformer-feedback and a generator with capacitative feedback are derived and the same or almost the same equations as for the generator with autotransformer-feedback are obtained. There are 5 figures, and 6 references, 4 of which are Soviet.

SUBMITTED: May 29, 1957

Card 3/3

SOV/108-13-2-5/15

Conditions for Oscillation and Frequency of Oscillations of Junction-type Triode Transistor Oscillators

input resistance of the triode has a finite value. The value of n_2 with a minus sign before the root is of interest for practice. - Going on to the problem of the frequency of produced oscillations it is referred to the fact that the self-oscillation frequency in the moment of self-excitation is meant by it, that is under consideration of the phase displacement in the triode at low signals but without consideration of the frequency correction at the expense of the nonlinearity of the system. Starting from equation (4) the formula with two values for the frequency of the produced oscillations is derived. Two values are obtained, because the inductive three-point according to its nature is a two-circuit system. This equation (18) shows that the frequency of the produced oscillations approximates the resonance frequency of the oscillation circuit, if the expression in square brackets is equal to one. For this case equation (23) is obtained. This equation shows that together with the increase of the self-oscillation frequency the quantity of the capacity C_1 must decrease, which also corresponds to the idea in physics of the activity of the phase-displacing circuit in the autotransformer scheme. In a similar way the formulae for a generator

Card 2/3

SOV/108-13-2-5/15

AUTHOR: Berestnev, P. D.

TITLE: Conditions for Oscillation and Frequency of Oscillations of Junction-type Triode Transistor Oscillators (Usloviya samovozhbuzhdeniya i chastota avtokolebaniy generatorov na ploskostnykh poluprovodnikovykh triodakh)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, Nr 2, pp. 36 - 43 (USSR)
Received: April 25, 1958

ABSTRACT: Here the formulae for the self-excitation conditions and self--oscillation frequency for self-excited alternating current generators with transformer-, autotransformer- and capacitative feedback are derived. For this purpose at first the general fundaments - equation (3) for the self-excitation conditions and equation (4) for the approximated value of the self-oscillation frequency (without consideration of the non-linearity of the system) - are put down. Then the generator with autotransformer-feedback is investigated. Starting from (3) the formula for the coupling-coefficient n_2 is obtained with two values for it. Two values are obtained because the

Card 1/3

PA - 3216

A Simplified Analysis of Circuit Diagrams for High Frequency Generators with Self-Excitation in Flat Crystal Triodes.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED: 26 January 1957
AVAILABLE: Library of Congress

Card 2/2

PA - 3216

AUTHOR: BERESTNEV, P.D.

TITLE: A Simplified Analysis of Circuit Diagrams for High Frequency Generators with Self-Excitation in Flat Crystal Triodes. (Uproshchennyy analiz skhem vch generatorov s samovozbuzhdeniyem na ploskostnykh kristallicheskikh triodakh. Russian).

PERIODICAL: Radiotekhnika, 1957, Vol 12, Nr 4, pp 39 - 44 (U.S.S.R.)
Received: 6/ 1957 Reviewed: 7 /1957

ABSTRACT: It is possible to obtain approximate formulae for the generated frequency and the self-excitation conditions if a crystal triode is conceived as an active linear quadripole with Y-parameters. The paper under review derives these formulae for two autogenerator circuit diagrams (with a common emitter and common basis) with an oscillatory circuit in the circuit of the collector. The equitation for the amplification coefficient with regard to the voltage is found and the real part is separated from the imaginary part. The real part is equated to one, and then the conditions for the self-excitation are obtained. The connection between the input circuit and the output circuit may be established by a transformer or autotransformer, or it can be a capacity connection. A chart contains a compilation of the data of the three Soviet triode types P6G with respect to the Y-parameters. (2 reproductions, 1 chart, 1 Slavic reference).

Card 1/2

KOBZEV, V.V.; BERESTNEV, P.D.

Designing high-frequency oscillators equipped with junction triodes. Poluprov. prib. i ikh prim. no.2:288-297 '57. (MIRA 11:6)
(Oscillators, Transistor)

BERESTNEV, P. D., and KOBZEV, V. V.,

"Problem of Designing High-frequency Self-excited Oscillators Equipped with Junction Transistors," Semiconductor Devices and Their Uses; Collection of Articles, No. 2, p. 288. Moscow, Izd-vo "Sovetskoye radio," 1957.

BERESTNEV, P. D., Cand Tech Sci -- (diss) "~~Investigation~~ Study of ~~the~~ junction autogenerators of sinusoidal fluctuations on ~~the facets of~~ crystal triodes." Mos, 1957. 9 pp. (Min ~~Intercommun~~ of Communications USSR, Mos ~~Electrotech~~ Electrical Engineering Inst of ~~Inter~~ Communications), 110 copies. (KL, 9-58, 116)

BERESTNEV, L.B.; DROZDOV, S.S., red.; STEBLYANKO, T.V., tekhn. red.

[Handbook for rural electricians]Spravochnik sel'skogo elektromontera. Stavropol', Stavropol'skoe knizhnoe izd-vo, 1962. 151 p. (MIRA 16:3)

(Rural electrification—Handbooks, manuals, etc.)
(Electric engineering—Handbooks, manuals, etc.)

BERESTIZHEVSKIY, N.B. (Uman')

Concept of a diagonal surface in a polyhedron. Mat.v shkole no.4:67-68 Jl-Ag '60. (MIRA 13:9)
(Polyhedra)

BERESTIZHEVSKIY, N. (Uman')

Some problems in the study of the subject "dihedral angles". Mat. v shkole no.5:65-66 S-O '59. (MIRA 13:2)
(Geometry, Solid--Problems, exercises, etc.)

BERESTINSKIY, G.

Educational work in automobile schools. Avt.transp.39 no.2:45 F '61.
(MIRA 14:3)

1. Ryazanskaya avtoshkola.
(Highway transport workers--Education and training)

BERESTINSKIY, G., inzh. (Ryazan')

How to check wheel camber and toe-in angles. Za rul. 19 no. 2:17-18 F '61. (MIRA 14:4)

(Automobiles--Wheels)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BEREESTINSKIY, G.

Draft traffic regulations should be completed. Avt. transp. 38 no. 12:41 D '60. (MIRA 13:12)

1. Zamestitel' direktora Ryazanskoy avtoshkoly.
(Traffic regulations)

BERESTINSKIY, G., inzh. (Ryazan')

Object lessons and once more object lessons. Za rul. 18 no.10: 16 O '60. (MIRA 14:1)
(Automobile drivers)

BERESTINSKIY, G., inzh. (Ryazan')

Brake system. Za rul. 17 no.9:18-19 S '59. (MIRA 13:1)
(Automobiles--Brakes)

BERESTINSKIY, G.

Efficient utilization of lesson time. Za rul. 17 no.7:19 Jl '59. (MIRA 13:1)

1. Zaveduyushchiy uchebnoy chast'yu Ryazanskoy avtomobil'noy shkoly.
(Automobile drivers)

BERESTINSKIY, G., inzh. (Ryazan')

Automatic heating of engines. Za rul. 16 no.7:11-12 Jl '58. (MIRA 11:10)

(Automobiles--Cold weather operation)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTINSKIY G.I.

DREVAL', K.P.; BERESTINSKIY, G.I.

A textbook not wholly valuable ("Manual for the study of machinery. Pt. 2: Automobile" by V.P. Bespal'ko, M.N. Zhidelev, and B.P. Nikitin. Reviewed by K.P. Dreval' and G.I. Berestinskii). Politekh. obuch. no.3:81-82 Mr '58. (MIRA 11:2)

(Automobiles)

(Bespal'ko, V.P.) (Zhidelev, M.N.) (Nikitin, B.P.)

BERESTINSKIY, G., inzhener; FEDOROV, Yu., inzhener.

The K-82 carburetor. Za rul. 15 no.4:10-11 Ap '57. (MLRA 10:6)
(Automobiles--Engines--Carburetors)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTINSKIY, G., inzh. (Ryazan')

Why does a motor vehicle turn over? Za rul. 21 no.7:24-25 Jl '63. (MIRA 16:8)

(Stability of automobiles)

BERESTINSKIY, G., inzh. (Ryazan')

Is running-out useful? Za rul. 21 no.3:20-21 Mr '63.
(MIRA 16:4)

(Automobiles—Dynamics)

ACC NR: AM5022324

AVAILABLE: Library of Congress

SUB CODE: 20/ SUBM DATE: 01Dec64/ ORIG REF: 003/ OTH REF: 025

Card 4/4

ACC NR: AM5022324

Card 3/4

ACC NR: AM5022324

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ACC NR: AM5022324 Monograph UR/

Berestetskiy, V. B.

19

Dynamic symmetries of strongly interacting particles (Dinamicheskiye simmetrii sil'novzaimodeystvuyushchikh chastits) Moscow, 1964. 100 p. illus., biblio. 350 copies printed.

Series note: USSR. Gosudarstvennyy komitet po ispol'zovaniyu atomnoy energii. Institut teoreticheskoy i eksperimental'noy fiziki. [Doklady] no. 301

TOPIC TAGS: strong interaction, weak interaction, elementary particle, high energy physics, hadron, lepton, baryon, quark

PURPOSE AND COVERAGE: This booklet is intended for nuclear physicists. The booklet describes the dynamic symmetries of strongly interacting particles. The author thanks L. B. Okun'. There are 28 references, primarily English.

TABLE OF CONTENTS:

Card 1/4

BERESTETSKIY, V.B.

Dynamic symmetry of strongly interacting particles. Usp. fiz. nauk 85 no.3:393-444 Mr '65. (MIRA 18:4)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

L 10210-63

ACCESSION NR: AP3000056

5

simultaneously a zero pole in both its "sense" and "nonsense" elements. The Gell-Mann hypothesis is therefore in agreement with the analytic properties of the residues of physical partial wave amplitudes near $j = 0$ and ensures the finite nature of all scattering amplitudes. "I express my gratitude to I. Ya. Pomeranchuk for numerous important discussions, and also to V. N. Gribov, N. N. Meyman, and I. M. Shmushkevich for discussions." Orig. art. has: 33 formulas and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki (Institute of Theoretical and Experimental Physics).

SUBMITTED: 06Dec62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 006 OTHER: 005

Card 2/2

L 10210-63 EWT(1)/FCC(w)/BDS--AFFTC/ASD--IJP(C)

ACCESSION NR: AP3000056

S/0056/63/044/005/1603/1611

AUTHOR: Berestetskiy, V. B.

57
52

TITLE: Asymptotic behavior of scattering amplitudes and the problem of "ghosts" on the trajectories of vacuum Regge poles

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1603-1611

TOPIC TAGS: Regge poles, scattering amplitudes, unphysical region

ABSTRACT: Asymptotic expressions are obtained for elastic pion-pion, pion-nucleon, and nucleon-nucleon scattering amplitudes in the region where the principal Regge pole passes through the value $j = 0$. It is shown that the difficulty arising in connection with unphysical (ghost) states arising when the scattering amplitude becomes infinite does not arise in actuality, and that the original Gell-Mann hypothesis that for given values of j and t the partial-wave amplitude is not a number but a matrix is sufficient to eliminate the 'ghost'. Moreover, if one accepts the usual ideas about the analytic properties of partial wave amplitudes as functions of j, then the matrix cannot have

Card 1/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTETSKIY, V.B.

Dynamic properties of elementary particles and the theory of the scattering matrix. Usp. fiz. nauk 76 no.1:25-77 Ja '62.

(Dynamics of a particle) (MIRA 15:2)
(Scattering(Physics))

ARUTYUNAYAN, V.M.; VARTANYAN, Yu.L.; CHUBARYAN, E.V.; SHAKHBAZYAN, V.A.; AMATUNI, A.TS.; DZHRBASHYAN, V.A.; MELIK-BARKHUDAROV, T.K.; TEVIKYAN, R.V.; BERESTETSKIY, V.B., prof., red.; SHTIBEN, R.A., red. izd-va; KAPLANYAN, M.A., tekhn. red.

[Problems in the theory of strong and weak interactions of elementary particles; lectures] Voprosy teorii sil'nykh i slabykh vzaimodeistvii elementarnykh chastits; lektsii. Pod obshchei red. V.B.Berestetskogo. Erevan, Izd-vo Akad. nauk Armianskoi DDR, 1962. 190 p. (MIRA 15:5)

1. Akademiya nauk Armyanskoy SSR. Fizicheskiy institut. (Nuclear reactions)

Higher nucleon charge and...

S/056/61/040/001/030/037
B102/B212

5 non-Soviet-bloc.

SUBMITTED: August 3, 1960

Card 6/6

$$a^l_{0,l} = NQ_l(1+2\eta^2)\left\{-\frac{A}{2p}J_1 - \frac{2\eta^2}{M}J_2\right\}, \qquad (12)$$

$$b^l_{0,l} = NQ_l(1+2\eta^2)\sqrt{\frac{l+1}{l}}\,\frac{\eta^2}{\omega}\left[-\frac{\omega^2 B}{\eta M}J_1 - \frac{\omega^2 J_2}{\eta M}\right];$$

$$A = \frac{Mm_e + Mp + p^2}{Mp} + (1+2\eta^2)\frac{p(M+p)}{M(m_e+p)}, \qquad B = 1 + \frac{M}{m_e+p};$$

$$J_1 = \frac{f^2\sqrt{\pi}}{2}\frac{1}{L^{3/2}}\left[1 - \frac{\sqrt{\pi}}{8\zeta}\left(1-\frac{1}{L}\right)\right], \qquad J_2 = -2f^2\sqrt{\pi}\frac{1}{L^{5/2}}\left[1 - \frac{\sqrt{\pi}}{8\zeta}\left(1-\frac{1}{L}\right)\right];$$

$$\zeta = \varepsilon\sqrt{L}/2, \quad \eta = \mu/p, \quad \omega = \eta\sqrt{1+\eta^2}, \quad N = ie^2p/2\pi,$$

$$L = \eta(l+1)/\sqrt{1+\eta^2}.$$

p_i, k_i are nucleon and meson momentum, respectively. Finally the authors thank I. Ya. Pomeranchuk for discussions. A. D. Galanin, A. F. Grashin, and B. L. Ioffe are mentioned. There are 6 references: 1 Soviet-bloc and

Card 5/6

is obtained; ${}^{3,1}\delta_l^J$ are the triplet and singlet scattering phases with a total momentum J, $\gamma_{0,1}^J$ and γ^J denote the state shift parameters for total spin 0 and 1 and the states with orbital momenta J-1 and J+1. If the spectral densities are determined by (5) the quantities a_i^k and b_i^k can be expressed by

$$a_l^l = NQ_l(1+2\eta^2)\left\{-\left[\frac{A}{p}+\frac{\omega B}{lM}\right]J_1+\left[\frac{\omega(1+2\eta^2)}{lM}-4\frac{l+1}{l}\frac{\eta^4(1-\eta^4)}{M}\right]J_2\right\},$$

$$a_l^{l-1} = NQ_l(1+2\eta^2)\left\{-\left[\frac{A}{p}+\frac{l+1}{l}\frac{\omega B}{M}\right]J_1+\right.$$
$$\left.+\left[\frac{l+1}{l}\frac{\omega(1+2\eta^2)}{M}+\frac{4(l+1)^2\eta^4(1-\eta^4)}{l(l-1)M}\right]J_2\right\},$$

$$a_l^{l+1} = NQ_l(1+2\eta^2)\left\{-\left[\frac{A}{p}-\frac{\omega B}{M}\right]J_1+\left[-\frac{\omega(1+2\eta^2)}{M}+\frac{4(l+1)\eta^4(1-\eta^4)}{(l+2)M}\right]J_2\right\},$$

$$b_l^{l-1} = NQ_l(1+2\eta^2)\left\{-\left[\frac{A}{2p}+\frac{l+1}{l}\frac{\omega B}{M}\right]J_1+\left[\frac{l+1}{l}\frac{\omega(1-2\eta^2)}{M}-\frac{2\eta^2}{M}\right]J_2\right\},$$

$$b_l^{l+1} = NQ_l(1+2\eta^2)\left\{-\left[\frac{A}{2p}-\frac{\omega B}{M}\right]J_1+\left[-\frac{\omega}{M}(1-2\eta^2)-\frac{2\eta^2}{M}\right]J_2\right\},$$

$$\overline{(r_1^{2n})}^V = \frac{4f^2(2n+1)!}{(4\mu^2)^n n!}\left[-\frac{(n-1)!\varepsilon}{8} + \frac{(2n-3)!!}{2^{n+1}} + \frac{\varepsilon^2}{4}\,\frac{(2n-1)!!}{2^{n+1}}\right], \qquad (9)$$

$$\overline{(r_2^{2n})}^V = \frac{f^2(2n+1)!}{\varepsilon(4\mu^2)^n n!}\left[\frac{(n-2)!}{4} - 2\varepsilon\,\frac{(2n-3)!!}{2^{n+1}}\right];$$

$$\rho^V(r) = \frac{f^2}{(2\pi)^2}e^{-2\mu r}\left[-\frac{\pi e}{r^3} + 3\sqrt{\frac{\pi}{\mu}}\frac{1}{r^{7/2}}\right],$$

$$\rho_2^V(r) = \frac{f^2}{(2\pi)^2}e^{-2\mu r}\left[-6\sqrt{\frac{\pi}{\mu}}\frac{1}{r^{7/2}} + \frac{4\pi}{\mu e}\frac{1}{r^4}\right]. \qquad (10)$$

Finally the deviation from its value of the scattering phase at an electron-nucleon scattering for a point nucleon is studied and expression

$$[\sqrt{l(l-1)}/(2l-1)](a_l^{l-1} - b_l^{l-1}) = 2i\gamma^{l-1},$$

$$[\sqrt{(l+1)(l+2)}/(2l+3)](a_l^{l+1} - b_l^{l+1}) = 2i\gamma^{l+1},$$

$$[(l+2)/(2l+3)]a_l^{l+1} + [(l+1)/(2l+3)]b_l^{l+1} = -2i\,{}^3\delta_l^{l+1},$$

$$[(l-1)/(2l-1)]a_l^{l-1} + [l/(2l-1)]b_l^{l-1} = -2i\,{}^3\delta_l^{l-1}, \qquad (11)$$

$$a_l^l = -2i^3\delta_l^l, \quad a_{0,l}^l = -2i\,{}^1\delta_l^l, \quad b_{0,l}^l = 2i\gamma_{0,1}^l.$$

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Higher nucleon charge and...

S/056/61/040/001/030/037
B102/B212

scattering and the part of the multi-meson and nucleon states. To compute these quantities was the aim of the present work; they are the higher charge and magnetic-moment distribution moments;

$$\left(\overline{r^{2n}}\right)_1^V = \frac{(-1)^n (2n+1)!}{n!} G_{1,2}^{V(n)}(0) = \frac{(2n+1)!}{\pi} \int^{\infty} \frac{g_{1,2}^V(t)\,dt}{t^{n+1}}$$

or higher multipole potentials of the nucleon transition a_1. Using

$$g_{1,p}^V = \frac{8}{3} f^2 \xi^3/\varepsilon^2, \quad g_{2,p}^V = 4f^2\xi^5/\varepsilon^4, \quad \xi \ll \varepsilon/2 \qquad (4),$$

$$g_{1,p}^V = f^2\left[2\xi - \pi\varepsilon/2 + \varepsilon^2/2\xi\right], \quad g_{2,p}^V = -2f^2\left[2\xi - \pi\xi^2/2\varepsilon\right], \varepsilon/2 < \xi \ll 1 \qquad (5),$$

with $\xi = \sqrt{t/4\mu^2 - 1}$ and $\varepsilon = \mu/M$, μ - meson mass, M - nucleon mass, and $\varrho^V(r) = \frac{1}{(2\pi)^2}\int_{4\mu^2}^{\infty} g^V(t)\frac{1}{r}\exp(-\sqrt{tr})\,dr$ the relations are obtained:

Card 2/6

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B102/B212

24.6900

AUTHORS: Berestetskiy, V. B., Terent'yev, M. V.

TITLE: Higher nucleon charge and magnetic-moment distribution moments

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 324-327

TEXT: The problem of spectral densities g_1^V and g_2^V of isovectorial electromagnetic form factors of the nucleon (G_1^V and G_2^V) due to two-pion states has been investigated in Refs.1 and 2. To calculate them, it is necessary to know the scattering amplitudes of pions by nucleons in the nonphysical region of transferred momenta and energies. From the pole part of the amplitudes and (π,N) scattering data, only expressions for amplitudes at a transferred momentum t near $t = 4\mu^2$ can be determined; the anomalous magnetic moment and mean square nucleon radius r^2 can not, however, be calculated without additional hypotheses about the (π,N)

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The Anomalous Magnetic Moments of Muon and Electron

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B006/B077

limiting momentum. It is shown how the radiative corrections in quantum dynamics can be calculated by application of the dispersion relations and unitarity conditions. The corrections to the magnetic moment are given by taking into account the cutoff at high momenta. $\lambda_o^2 \sim 18m_\pi^2 \approx 36m_\mu^2$ (Hofstadter) leads to $1 - \delta F = \sqrt{1 - 4m_\mu^2/\lambda_o^2}$, thus $\delta F \sim 0.06$ for the muon, and $\delta F = 2m_e^2/\lambda_o^2$ for the electron (m_e - its mass). The author thanks M. Terent'yev for discussions. There are 3 references: 1 Soviet, 1 US, and 1 Italian.

SUBMITTED: June 2, 1960

Card 2/2

86919

S/056/60/039/005/036/051
B006/B077

24.6900

AUTHOR: Berestetskiy, V. B.

TITLE: The Anomalous Magnetic Moments of Muon and Electron

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 5(11), pp. 1427 - 1429

TEXT: In a previous work the author together with O. N. Krokhin and A. K. Khlebnikov had calculated the anomalous moment $\delta\mu$ of the muon and had taken into consideration that quantum electrodynamics might not be applicable in the range of large momenta (Ref.1). By introducing Feynman's cutoff factor with the limiting momentum λ_o it was found that the deviation from $\delta\mu/\mu = (\alpha/2\pi)(1-\delta F)$. For $m_\mu^2/\lambda_o^2 \ll 1$ (m_μ - muon mass) the Schwinger correction was equal to $\delta F = 2m_\mu^2/3\lambda_o^2$. De Tollis pointed out that an introduction of a cutoff factor in a different way leads to a somewhat different value of δF. In the present work it is examined which value of $\delta\mu$ leads to the most convincing introduction of a

Card 1/2

Asymptotic Behavior of Cross Sections at High Energies

S/056/60/039/004/034/048
B006/B063

transformation of two particle into three, which is graphically shown in Fig. 1. Proceeding from the amplitude equation of this process, expressions are given in pole approximation for the differential cross section, the transferred momentum, etc. The transformation of two particles into four is studied analogously (see graphs of Figs. 2 and 3). It is found that in an energy range in which the total elastic scattering cross section is independent of energy, the cross section for the transformation of two particles into three is not reduced with an increase in energy, and that the cross section for the transformation of two particles into four increases logarithmically with an increase in energy. This suggests that the elastic scattering cross section tends to zero at very high energies. The authors thank V. N. Gribov, L. D. Landau, V. N. Mel'nikov, L. B. Okun', and I. M. Shmushkevich for discussions. I. M. Dremin and D. S. Chernavskiy are mentioned. There are 5 figures and 5 references: 2 Soviet, 1 US, 1 Italian, and 1 Dutch.

SUBMITTED: May 25, 1960

Card 2/2

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S/056/60/039/004/034/048
B006/B063

24.6520

AUTHORS: Berestetskiy, V. B., Pomeranchuk, I. Ya.

TITLE: Asymptotic Behavior of Cross Sections at High Energies

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 4(10), pp. 1078 - 1086

TEXT: The data on high-energy particle collisions available at present lead to the assumption that with an increase in energy the total collision cross section tends to a constant limit which is of the order of $1/\mu^2$, where $1/\mu$ is the Compton wavelength of the pion. The elastic diffraction scattering cross section likewise tends to a limit, and the cross sections for the individual inelastic processes tend to zero with an increase in energy. However, these simple assumptions may well be wrong. The present paper gives approximate calculations of cross sections for inelastic processes, which indicate a different asymptotic behavior of the cross sections. As these calculations are only approximative, the conclusions drawn cannot make a claim to finality. They indicate, however, that the situation may be much more complicated. First, the authors study the

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BERESTETSKIY, V.B.; ZHIZHIN, Ye.D.

Photoproduction of π-mesons on nucleons in peripheral collisions. Zhur. eksp. i teor. fiz. 39 no.2:418-426 Ag '60. (MIRA 13:9)
(Mesons) (Collisions (Nuclear physics)) (Nucleons)

β-Interaction and Form Factor of the Nucleon SOV/56-36-4-60/70

complicated expression is given for the differential cross section of (1). There are 5 references, 1 of which is Soviet.

SUBMITTED: January 6, 1959

Card 2/2

21(7), 24(5)

AUTHORS: Berestetskiy, V. B., Pomeranchuk, I. Ya. SOV/56-36-4-60/70

TITLE: β-Interaction and Form Factor of the Nucleon (β-vzaimodeystviye i formfaktor nuklona)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 4, pp 1321-1322 (USSR)

ABSTRACT: One of the most characteristic properties of β-interaction is the rapid increase of effectivity with energy. However, the existence of strong interaction leads to an occurrence of form factors in nucleons which may influence the energy dependence of the β-processes considerably. An investigation of β-transformations at high energies, e.g. process (1) of transformation of the electron into a neutrino ($e + p \rightarrow n + \nu$) may serve the purpose of determining these form factors. Today it may be said that the β-interaction consists of V- and A-V-interactions. For process (1) the matrix element in the present "Letter to the Editor" is written down according to references 3 and 4. On the basis of the assumption that the hypothesis developed by Gell-Mann and Feynman (Ref 1) holds good and that the electron energy is supposed to be high as against its own mass, a rather

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(Chapter VII); the study of dynamic processes in the first, not zero, approximation, not related to the removal of divergences and renormalizations, is given in Chapters V and VI; and higher approximations, in Chapter VIII. The number of electrodynamic phenomena covered has been increased, and in particular the theory of polarized particle processes, the method of "sighting" ("target", "aimed" or "definite-purpose") parameters, and other concepts have been introduced. The book aims on one hand to give a clear physical picture of principles and results of quantum electrodynamics and, on the other, to give, the reader an opportunity to master the method and technique of appropriate computation. The authors thank V. Aleksin, V. Bar'yakhtar, V. Boldyshev, D. Volkov, S. Peletminskiy, R. Polovin,and P. Fomin for assistance in preparing the manuscript. References are included as footnotes.

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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

effect, brehmsstrahlung, the creation and annihilation of electron-position pairs, the equivalent photon method, radiative corrections to atomic level and scattering, scattering of light by light and polarized particle processes are reviewed. The present intense interest in these subjects is attributed by the authors to the discovery of the nonconservation of parity. The various sections contain numerous computations, illustrated applications of general methods, and final results in the form of formulas and curves which may be used both in theoretical and experimental applications. As to the principal problems of quantum electrodynamics, the theory of renormalizations underwent the greatest revision. While the authors do not profess complete mathematical strictness, they attempt to set forth the concept of renormalizations from one simple physical point of view, avoiding prescribed methods for removing divergences and utilizing the general properties of quantum mechanics systems to the full. In relation to this, some changes have been made in the organization of the book: the investigation of the S matrix in light of the theory of radiative corrections is treated in a separate chapter

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BERESTETSKIY, V.B.

24(5); 21(7),(8) PHASE I BOOK EXPLOITATION SOV/2950

Akhiyezer, Aleksandr Il'ich, and Vladimir Borisovich Berestetskiy

Kvantovaya elektrodinamika (Quantum Electrodynamics) 2d ed., rev. Moscow, Fizmatgiz, 1959. 656 p. Errata slip inserted. 10,000 copies printed.

Ed.: Ye. Ye. Zhabotinskiy; Tech. Ed.: N. A. Tumarkina.

PURPOSE: This book is intended for students in advanced physics courses, Aspirants, and scientific researchers in this field.

COVERAGE: This is the second edition of a book which first appeared in 1953. Most of the chapters have been rewritten and much new material has been included. The book examines in detail the basic theories of quantum electrodynamics; i. e., the general theory of wave fields, the theory of Green's functions, and the theory of a scattering (S-) matrix. Radiation, internal conversion of gamma rays, the behavior of electrons in an external field, the Compton

Card 1/26

53-64-3-8/8

Lev Davidovich Landau. On His Fiftieth Birthday

Then the author shortly reports on various works which do not belong to the theory of solids. During World War II he worked, among others, also in the field of "ordinary" hydrodynamics. Finally a short survey on Landau's works concerning quantum electrodynamics and the theory of elementary particles follows. One of his last works deals with the problem of the non-conservation of parity in weak interactions. There are 1 figure and 81 references, all of which are Soviet.

: 1. Physics--USSR 2. Scientific personnel--USSR

Card 3/3

specializing in theoretical physics, and a helpful method for the theorist. This work contains many original ideas and methods, it is organically connected with Landau's systematic work on the education of young theoretical physicists. Landau founded a great scientific school, the representatives of which are successfully working in various fields of theoretical physics. He was three times awarded the Stalin prize and in 1946 was elected Ordinary Member of the Academy of Sciences of the USSR. He was born in Baku on January 22, 1908. Already when 14 years of age he entered Baku University, and in 1924 he changed over to Leningrad University where he finished his studies in 1927 when he was 19 (nineteen !) years of age. After his university studies he worked in the Leningrad Institute for Technical Physics. His first scientific work was published in 1926. Starting from 1926 he spent altogether one and a half years in Denmark, Germany, Switzerland, Holland and England. In 1933 and 1934 he also came to Copenhagen on an invitation by Niels Bohr. In 1930 he wrote a fundamental work on the theory of metals, and in 1935 a fundamental work on the theory of ferromagnetism. He also contributed essentially to the theory of phase transitions.

BERESTETSKIY, V. B.

AUTHOR: Berestetskiy, V. B. 53-64-3-8/8

TITLE: Lev Davidovich Landau (Lev Davidovich Landau) On His Fiftieth Birthday (K pyatidesyatiletiyu so dnya rozhdeniya)

PERIODICAL: Uspekhi Fizicheskikh Nauk, 1958, Vol. 64, Nr 3, pp. 615-623 (USSR)

ABSTRACT: Landau takes one of the most prominent places in modern theoretical physics. The unusual scope of his scientific interests and of his scientific work are especially to be mentioned. Nowhere his wide scope and his feeling for the unity of theoretical physics is so fully demonstrated as in the work of several volumes created by himself and Ye. M. Lifshits which is called "Theoretical Physics" ("Teoreticheskaya fizika"). The 6 volumes edited until now (mechanics, theory of the field, quantum mechanics, statistical physics, mechanics of continuous media, electrodynamics of continuous media) simultaneously represent an encyclopedia of modern theoretical physics, a systematic guide for youngsters

Card 1/3

The Polarization of a Nucleus by a Radiation K-Capture SOV/56-35-2-47/60

the vector of the photon momentum although the photon is emitted without a change of parity. However, the polarization of the nucleus depends on the polarization of the absorbed virtual electron. This electron is polarized along the direction of its momentum, and this direction is opposite to that of the momentum of the emitted photon. The author thanks A. I. Alikhanov, V. A. Lyubimov, and L. B. Okun' for discussing this paper. There are 6 references, 2 of which are Soviet.

SUBMITTED: May 19, 1958

Card 2/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

24(7)

AUTHOR: Berestetskiy, V. B. SOV/56-35-2-47/60

TITLE: The Polarization of a Nucleus by a Radiation K-Capture (Polyarizatsiya yadra pri radiatsionnom K-zakhvate)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2(8), pp 537-538 (USSR)

ABSTRACT: First, some previous papers are mentioned. The polarization of atomic nuclei is caused also by the radiation capture of an orbital electron $e + p \rightarrow n + \nu + \gamma$. Also in this case, the polarization of the nucleus is described by the formula $\langle \vec{J} \rangle = (1/3)(j + 1) \xi \vec{v}$, where $c\vec{v}$ denotes the velocity of the photon and ξ is a coefficient connected with positron decay. In order to prove this assumption, the author investigated the matrix element $V_{m_1 m}$ of the radiation K-capture with a transition of the nucleus from the state $j_1 m_1$ to the state jm. An expression is given for the density matrix of the polarization of the daughter nucleus. It may seem strange that the pseudovector $\langle \vec{J} \rangle$ is proportional to

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$\langle\vec{\sigma}\rangle = (r\xi/j_2)\vec{n}(\vec{n}\vec{v})$. In this case the polarization is longitudinal and does not depend on the energy of the conversion electron. The following holds for the case of an electric multipole:

$$(\vec{\sigma}) = r\,\frac{L+1}{1+2\kappa+\kappa^2(2L+1)/L}\;\frac{\xi}{j_2}\left\{(\kappa+\kappa^2)(\vec{n}(\vec{n}\vec{v})-\vec{v})+\frac{\kappa^2}{L}(\vec{n}\vec{v})\vec{n}\right\};$$

$\kappa = (\varepsilon - m)/(\varepsilon + m)$

$r = \left[L(L+1)+j_2(j_2+1) - j_1(j_1+1)\right]/2L(L+1)$. In this case a longitudinal as well as a transversal polarization exist, both being dependent on energy. At low velocities v_k of the conversion electrons longitudinal polarization is proportional $(v_k/c)^4$, and transversal polarization $\sim (v_k/c)^2$. In conclusion the authors thank A.I.Alikhanov, Académician, and V.I.Lyubimov for the interest they displayed and for their discussions. There are 3 references, 2 of which are Soviet.

AUTHORS: Berestetskiy, V. B., Rudik, A. P. SOV/56-35-1-22/59

TITLE: The Polarization of the Internal Conversion Electrons Following a β-Decay (Polyarizatsiya elektronov vnutrenney konversii, sleduyushchey za β-raspadom)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 1, pp 159 - 164 (USSR)

ABSTRACT: The authors in the present paper investigate the connection between the polarization of the conversion electrons and the direction of the electrons emitted during a β-decay. The Coulomb-(Kulon) field of the nucleus is neglected in this connection. For the (axial) vector of the polarization of the conversion electrons the following ansatz is made (for the case of permitted β-transitions): $\langle\vec{\sigma}\rangle = a(\vec{v}\vec{n})\vec{n} + b(\vec{v} - (\vec{v}\vec{n})\vec{n})$ (a and b are constants which depend on the momenta of the nuclear state and the transition energy, $c\vec{v}$ is the velocity of β-electrons, and $\vec{n}$ the unit vector in the direction of the conversion transitions). For the case of a magnetic multipole the following is obtained:

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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTETSKIY, V.B., IOFFE, B.L., RUDIK, A.P., and TER'MARTIROSYAN, K.A
(Acad. Sci. USSR)

"β-Decay and Non-Conservation of Parity," Nuclear Physics, Vol. 5, No. 3, Feb 1958 (No. Holland Publ. Co., Amsterdam)

Abst; Effects due to non-conservation of parity such as longitudinal and transverse polarization of β-electrons, angular distribution of β -electrons from an oriented nucleus (including the case when the direction of the recoil nucleus momentum is fixed are examined in the present paper for the cases of allowed β-transitions and first order forbidden transitions. It is shown thatowing to the influence of the Coulomb field the magnitude of these effects for forbidden transitions in heavy and intermediate nuclei is the same as for allowed transitions, perceptible deviations are observed in light nuelei ($Z \leq$ 20). In the particular case of a 0-0 transition comparison with experiment may yield important data on the contribution of pseudoscalar coupling. Unique transitions ($\Delta j =$ 2,yes) for which the eletron angular distribution of oriented nuclei essentally differs from that for allowed transitions are considered separately.

Scattering of K-Mesons with Change of Intrinsic Parity. PA - 2088

elements consists of a twodimensional matrix with respect to spin variables) The matrix R can be represented in the form of $R = a + bC_p$, where a denotes a scalar and b a pseudoscalar. Amplitude au describes the usual scattering (without transformation of internal symmetry) and has the form which is usual in the theory of the scattering of spinor waves. However, the authors also wish to ascertain the general form of the amplitude bu which describes the scattering with modification of internal symmetry.
For this purpose the relation between the inciding and diverging wave is studied with certain values of momenta and of symmetry. This relation is explicitly written down and discussed. In the case of small momenta the term $j = 1/2$ corresponding to the transitions $s_{1/2} \rightleftarrows p_{1/2}$ will suffice. From the expression obtained for b it follows that, in the case of such a scattering, nucleons are not polarized. The considerations discussed here hold good also for the scattering of Σ- and Λ-particles by nuclei with the spin zero, if the spin of these particles is equal to 1/2. These considerations also hold good for the processes $K + N \rightarrow \Sigma + \pi$ and $K + N \rightarrow \Lambda + \pi$.

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Card 2/2

BERESTETSKIY, V.B.

AUTHOR BERESTECKIJ, V.B., BYČKOV, JU.A. PA - 2088

TITLE Scattering of K-Mesons with Change of Intrinsic Parity (Rassejanie K-mesonov s izmeneniem vnutrennej četnosti).

PERIODICAL Zhurnal Eksperimental'noi i Teoret. Fiziki, 1957, Vol 32, Nr 1, pp 181-183 (U.S.S.R.)
Received 3/1957 Reviewed 4/1957

ABSTRACT Analysis of experimental data on the decay of K-mesons (various relevant works are mentioned) leads with high probability to the following conclusions. 1) The spin of K-mesons is equal to zero. 2) K-mesons may occur in states of different internal symmetry, i.e. with positive (θ-mesons) and with negative (τ-mesons) symmetry. On the occasion of a collision between K-mesons and nucleons, the internal symmetry of K-mesons may change. (Transformation of θ-mesons into τ-mesons and vice versa) For the purpose of the investigation of some general properties of such a process, the authors form the wave function of the ΨK-meson-nucleon-system in the form of a total of two spinors Ψ_θ and Ψ_τ (which transform in different way on the occasion of reflection). $\Psi = \binom{\Psi_\theta}{\Psi_\tau}$, $I\Psi_\theta = \Psi_\theta$, $I\Psi_\tau = -\Psi_\tau$. Here I denotes the reflection operator. In the scattering problem Ψ has the following usual form $\Psi = u \exp(ik\vec{n}_0\vec{r}) + F(\vec{n})e^{ikr}/r$. Here $\vec{n}_0$ and $\vec{n}$ denote the unit-vectors of the inciding and scattered wave, i and F the corresponding amplitudes, which, similar to Ψ are bispinorial quantities. If the properties of interaction between θ- and τ-mesons and the nucleons are equal, this equality also holds good for the "symmetrically conjugated" amplitudes. The amplitude F in the above equation can be written down as F = Ru, in this connection R denotes a twodimensional matrix (Each of its

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[illegible]

[illegible] ANGULAR CORRELATION IN CASCADE DECAY OF HY- [illegible] and V. B. [illegible], Soviet Phys. [illegible]

The cascade decay [illegible] is considered. Formulas describing the angular correlation in the decay are given. [illegible]

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"Nonconservation of Parity in the -Decay."

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

scattering f must have the following values: $\sigma_s = 10^{-30}$ cm^2 for Be, and $\sigma_s = 0{,}9.10^{-28}$ cm^2 for U.

Next, diffraction scattering is compared with the scattering of photons by a COULOMB field. The cross section σ_γ of scattering by a COULOMB field at E $\gg$ cm^2 has the value $\sigma_\gamma = 8{,}5.10^{-35}Z^4$ cm^2.

Thus, the ratio σ_s/σ_γ is modified from 50 for Be to 10^{-2} for U, i.e. in the case of heavy nuclei the diffraction scattering is considerably less efficacious than the coherent scattering by the charge. Nevertheless, this effect must be recognizable because of a different angular distribution. Corresponding to the formula $d\sigma_s/do = (1/2)\sigma_s(kR)^2 \Phi^2 (kR\Theta)$ diffraction scattering is effective in the case of the angles $\Theta_s \sim 1/kR$, whereas scattering by the COULOMB field is concentrated within the domain $\Theta_\gamma \sim$ cm^2/E. Therefore, the differential cross sections for U at $\Theta = 0{,}015$ are equal at E = 300 MeV. $d\sigma_\gamma/do$ diminishes rapidly, but $d\sigma_s/do$ in this domain retains the constant value of $\sim$ 0,8 millibarn ($\Theta_s = 0{,}09$).

INSTITUTION:

BERESTETSKIY, V.B.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1738
AUTHOR BERESTECKIJ, V.B., KUZNECOV, E.V.
TITLE The Diffraction Scattering of Energy-Rich Photons by Nuclei.
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.4, 723-723 (1956)
Issued: 1 / 1957

The properties of a nucleus with respect to energy-rich photons (at $kR \ll 1$, where k denotes the wave number of the photon and R - the radius of the nucleus) can be characterized by a complex refraction index: $n + i\varkappa/k$, where $n \sim 1$ and $\varkappa R \ll 1$ applies. The value of the absorption coefficient $\varkappa$ can be expressed on the basis of general formulae by the experimentally known cross section σ_c of the photoproduction of mesons on nuclei: $\varkappa R = 3\sigma_c^2/4\pi R^2$. The existence of an absorption must lead to an elastic scattering of photons. By using the general diffraction relations for the semi-transparent nuclei it is without difficulty possible for the cross section σ_s of elastic scattering to obtain the expression $\sigma_s = 9\sigma_c^2/(32\pi R^2)$. The amplitude of scattering in a small angle Θ is $f(\Theta) = ik\varkappa\int_0^R J_0(k\Theta\sqrt{R^2 - s^2})\, s^2\, ds$ and herefrom we find for the differential cross section: $d\sigma_s/do = (1/2)\sigma_s(kR)^2\,\Phi^2(kR\,\Theta)$, $\Phi(x) = x^{-2}(x^{-1}\sin x - \cos x)$. In accordance with experimental data $\sigma_c \sim 10^{-28}\,A\,cm^2$ applies in the case of photon energies of the order 300 MeV. Here the cross section of the elastic

Žurn.eksp.i teor.fis, 31, fasc.4, 722-723 (1956) CARD 2 / 2 PA - 1898

be considered to be a straight-lined trajectory in the domains in which retardation is still essential. One finds $T = 2T_o - T_1$, where T_o denotes the ionization deceleration of the electron alone, and T_1 an interference term. When computing T_1 it is of essential importance that the transversal difference of the components of the pair be considerably greater than the longitudinal difference. In the integral expression for T_1 the limiting value for the dielectricity constant ε of the medium at high frequencies is essential. We finally find: $T_1 = (ce^2\lambda^2/\pi)\int(\cos k_x s/(k_x^2+k_y^2+\lambda^2))\, dk_x dk_y = 2e^2c\lambda^2 K_o(s\lambda)$. Here k_o denotes a corresponding BESSEL function and it holds that $s = (x_2 - x_1)$. The convergence of this integral for T_1 means that in the interference effect the large distances (for which macroscopic observation is permitted) are of importance. The analogous integral for T_o is known to diverge and must be limited by a certain maximum value of the transversal wave vector k_m. In the case of great s ($s\lambda \gg 1$) the interference effect vanishes. At $s\lambda \ll 1$ it is possible to use the representation $K_o(z) = \ln(2/\gamma z)$ with $\gamma = e^C = 1,781$ and it is then true that $T_1 = 2e^2c\lambda^2 \ln(r_{max}/s)$.with $r_{max} = 2/\gamma\lambda$. If T_o is written down in an analogous form: $T_o = ce^2\lambda^2 \ln(r_{max}/r_{min} = a(\hbar/mc)\sqrt{mc^2E_m}$ (a=1,85, it is possible to represent T in the form $T = 2T_o \ln(s/r_{min})/\ln(r_{max}/r_{min})$. The quantity E_m entering into r_{min} denotes the maximum energy that is transferred to the atom of the electron.

INSTITUTION:

~~BERESTETSKIY, V.B.~~ BERESTETSKIY, V.B.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1898
AUTHOR BERESTECKIJ, V.B., GEŠKENBEJN, B.V.
TITLE On the Ionization Slowing-Down of Electron-Positron Pairs of High Energy.
PERIODICAL Zurn.eksp.i teor.fis, 31, fasc.4, 722-723 (1956)
Issued: 1 / 1957

Because of the interference of electron- and positron fields, in the case of short distances from the place of the creation of the electron-positron pair, the ionization caused by this pair is less than the double ionization of an electron. This phenomenon was theoretically investigated by A.E.ČUDAKOV (Izv.Akad.Nauk SSSR, 19, 650 (1955). The present report describes a different derivation of the formula of ionization slowing-down of such a pair in order to define the limits of its applicability with precision. For this purpose the authors used LANDAU'S method for the derivation of the formula of ionization losses at high energies (within range of the polarization effect). If electron and positron are at the points $\vec{r}_1(t)$ and $\vec{r}_2(t)$ respectively at a given point of time t, the energy loss of the pair per time unit is $T = ec\left\{ \vec{v}_1\vec{E}\,(r_1,t) - \vec{v}_2\vec{E}\,(r_2,t)\right\}$; here $c\vec{v}_1$ and $c\vec{v}_2$ denote the velocities of the positron and electron respectively, and E the electric field of the pair. This field may be looked upon as a field in a macroscopic medium and can be represented in form of a FOURIER integral. The trajectories of the charges scattered in the medium can tributions on the field strength H may serve the purpose of determining the magnetic moment of a -particle. The correlation function has the following form in the case of the presence of a magnetic field:

$$I = \sum_n \frac{1}{2n+1} A_n \sum_{\nu=-n}^{n} \frac{1}{1 + i\omega\tau} Y_n^{\nu *} (n_1) \quad Y_{n\nu} (\vec{n}_2)$$

Here ω denotes the corresponding LARMOR-frequency, τ - the life of the Λ -particle, A_n the coefficients of P_n in the formulae (1). If the gyromagnetic ratio of the Λ-particle is equal to that of the proton, then $\omega\tau$ attains the value 0,3 in the case of H 3.10^4 G, Above all the formula (2) assumes the following form in the case of j = 3/2:

$$I = 1 + P_2 (\cos \theta_1 \; P_2 (\cos \theta_2) +$$
$$+ (3/4)\sin 2\theta_1 \sin 2\theta_2 \left[\cos(\varphi_1-\varphi_2) - \omega\tau \sin(\varphi_1-\varphi_2)\right] / (1 + \omega^2\tau^2) +$$
$$+ (3/4)\sin^2\theta_1 \sin^2\theta_2 \left[\cos 2(\varphi_1-\varphi_2) - 2\omega\tau \sin 2(\varphi_1-\varphi_2)\right] / (1+ 4\omega^2\tau^2)$$

Here θ_1, φ_1, θ_2, θ_2 are the spherical angles of the vectors n_1 and n_2 in that coordinate system in which the z-axis has the direction of the magnetic field.

INSTITUTION:

BERESTETSKIY, V.B.

SUBJECT : USSR / PHYSICS CARD 1 / 2 PA - 1446
AUTHOR BERESTECKIJ, V.B., POMERANČUK, I.JA.
TITLE The Correlation Phenomena on the Occasion of the Capture of K-Mesons
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.2, 350-351 (1956)
Issued: 10 / 1956 reviewed: 10 / 1956

The capture of a K-meson by a proton with subsequent decay of the hyperon produced on this occasion, i.e. the reaction $K^- + p \to \Lambda^0 + \pi^0 \to p + \pi^- + \pi^0$ can be used for the determination of the spin of the -particle from the angular correlation of the pions.

If the spin of the K-meson is equal to zero, the initial system has the angular momentum 1/2 (if the K-meson is captured in the s-state). The following angular distribution $I_j(\theta)$ then occurs in dependence of the spin j of the Λ-particle and the angle θ between the directions n_1 and n_2 of the momenta with respect to the systems (, π^0) and (p, π^-) respectively (where $I_{1/2}(\theta) = 1$):

$$I_{3/2}(\theta) = 1 + P_2(\cos\theta) \sim 1 + 3\cos^2\theta$$

$$I_{5/2}(\theta) = 1 + (8/7)P_2(\cos\theta) + (6/7)P_4(\cos\theta) \quad 1 - 2\cos^2\theta + 5\cos^4\theta \qquad (1)$$

(Compare the analogous formulae for the decay of the Ξ particle as developed by R.GATTO, Nuov.Cim.2, 841 (1955). If the spin of the K-meson is equal to 1, the initial system may have either the angular momentum 1/2 or 3/2, and therefore the formulae of the angular correlations loose their uniqueness.

If the system is in an exterior magnetic field, the dependence of the angular dis-

Žurn.ėksp.i teor.fis,30, fasc.6,1169-1171 (1956) CARD 2 / 2 PA - 1415

$$J = 1/2: I = 1 - 0{,}6\cos^2\theta + a(1 + \cos^2\theta)$$

$$J = 3/2: I = 1 + 0{,}75\cos^2\theta + \alpha(0{,}4 - 1{,}2\cos^2\theta) + \alpha^2(0{,}37 + 0{,}48\cos^2\theta) + b.$$

$$J = 5/2: I = 1 - 0{,}45\cos^2\theta + \beta(0{,}4 - 1{,}2\cos^2\theta) + \beta^2(0{,}33 + 0{,}43\cos^2\theta) + c\left[(1-0{,}14\cos^2\theta) + \gamma(0{,}5-1{,}5\cos^2\theta) + \gamma^2(0{,}44-0{,}1\cos^2\theta)\right]$$

$$J = 7/2: I = 1 - 0{,}6\cos^2\theta + \delta(0{,}5 - 1{,}36\cos^2\theta) + \delta^2(0{,}26 + 0{,}48\cos^2\theta) + d\left[1 + 0{,}23\cos^2\theta + \varepsilon(0{,}7-2{,}1\cos^2\theta) + \varepsilon^2(0{,}5 + 0{,}01\cos^2\theta)\right]$$

In conclusion attention is drawn to the recently published work by R.GATTO, Nuovo Cim. 3, 665 (1956) on correlations on the occasion of the decay of Σ -particles.

INSTITUTION:

BERESTETSKIY, V.B.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1415
AUTHOR BERESTECKIJ, V.B., IGNATENKO, V.P.
TITLE Angular Distribution in the Case of the Cascade-Like Decay of Hyperons.
PERIODICAL Žurn.eksp.i teor.fis, 30, fasc.6, 1169-1171 (1956)
Issued: 8 / 1956 reviewed: 10 / 1956

Here the cascade-like decay $\Sigma^0 \to \Lambda^0 + \gamma \to p + \pi^- + \gamma$ is investigated. At first the wave function of the relative motion of the proton and the pion as well as the wave function of the entire system are explicitly given in the end state. With the help of the well-known addition theorem of the square of a spherical harmonic according to LEGENDRE'S polynomials and the summation properties of the coefficients of the vector separation, the angular distribution of the particles is computed.

In the following the angular distributions $I(\theta)$ for $j = 3/2$ and for various values of J are enumerated. With $j = 1/2$ the distribution is spherical symmetrical. (Several coefficients are determined by the decay mechanism and are expressed by a factor. If only the smallest L plays a role, the first two terms must be omitted in the following formulae). Denotations: j - spin of the Λ-particle, J - spin of the Σ-particle, L - angular momentum of the relative motion of photon and Λ-particle.

The following are the explicit expressions for the angular distributions:

BERESTETSKIY V.B.

B-5

Category : USSR/Theoretical Physics - Quantum Field Theory

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5703

Author : Berestetskiy, V.B., Krokhin, O.N., Khlebnikov, A.K.

Title : Concerning the Radiation Correction to the μ-Meson Magnetic Moment.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 788-789

Abstract : The deviation from the Schwinger formula is calculated for the radiation correction to the magnetic moment under the assumption that the integration with respect to the momenta must be restricted to an upper limit λ_0, where $h/\lambda_0 \sim 10^{-13}$ -- 10^{-14} cm, in connection with the results obtained by Landau and Pomeranchuk (Referat Zhur Fizika, 1956, 15733, 21813, 21814) concerning the inapplicability of the modern field theory to such distances. If this correction is written in the form $\Delta\mu/\mu = (\alpha/2\pi)(1 - \delta F)$, then $\delta F = (2/3)mc/\lambda_0$, where m is the mass of the particle. For the μ-meson, the value of δF may turn out to be not too small.

Card : 1/1

ILLEGIBLE

Berestetskiy, V.B.

PARTICLE ACCELERATORS: STRONG-FOCUSING ACCELERATOR

"Admission of Particles Into the Chamber of an Accelerator with Strong Focusing," by V.B. Berestetskiy, L.L. Gol'din, and D.G. Koshkarev, Pribory i Tekhnika Eksperimenta, No 3, November-December 1956, pp 26-31.

Discussion of the injection of particles in an accelerator with strong focusing. The problem of the scattering of particles by the residual gas is solved. The effect of space charge on the frequency of the betatron oscillations is considered. The construction of a system for injection of particles into an accelerator chamber is described in brief. Reference is made to work by Blachman and Courant (Physical Review, 1948 74, 140) and Greenberg and Berlin (Review of Scientific Instruments, 1951, 22, 293), and by Barden (Physical Review, 1954, 93, 1378).

Card 1/1

BERESTETSKIY, V.B.

USSR/Nuclear Physics - Mu-meson pair production

FD-3258

Card 1/1 Pub. 146 - 17/44

Author : Berestetskiy, V. B.; Pomeranchuk, I. Ya.

Title : Letter to the editor. Production of mu-meson pair during annihilation of a positron

Periodical : Zhur. eksp. i teor. fiz., 29, No 6(12), Dec 1955, 864

Abstract : According to the authors, if mu-mesons do not have peculiar to them any specific interaction more essential than electromagnetic interaction, then experimental investigation of electrodynamic processes with the participation of mu-mesons can give important information concerning the limits of applicability of the modern field theory and concerning the character of physical laws close to this limit, since the Compton wavelength of the mu-meson is comparable with those dimensions close to which one can expect radical changes in space-time concepts (I. Ya. Pomeranchuk, DAN SSSR, 103, 1005; 104, 51, 1955). They claim that deviation of experimental data from the formula for the effective cross-section of mu-meson pair production in the collision of positron with electron at rest should give information on maximum cross-section, minimum energy E_n of such pair production, etc.

Institution : Academy of Sciences USSR

Submitted : September 29, 1955

ILLEGIBLE

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R000204800032-6

BERESTETSKIY, V.B.

Category : USSR/Theoretical Physics - Quantum Electrodynamics B-3

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5674

Author : Berestetskiy, V.B.

Title : Development of Quantum Electrodynamics

Orig Pub : Vestn. AN SSSR, 1955, 25 No 10, 22-31

Abstract : Popular article, describing the present-day status of quantum electrodynamics. A historical survey of the problem of the electromagnetic mass of the electron is given. A clear explanation is given for the idea of the renormalization of charge and mass on the basis of an examination of which regions of space (or wavelengths) contribute to the self energy and polarization of vacuum.

Card : 1/1

BERESTETSKIY, V. B.

USSR/Scientific Organization - Theoretical physics

Card 1/1 Pub. 124 - 19/32

Authors : Berestetskiy, V. B., Dr. of Phys-Math Sc.

Title : Development of quantum electrodynamics and the theory of elementary particles

Periodical : Vest. AN SSSR 25/6, 90-93, June 1955

Abstract : Briefs are presented from the All-Union scientific conference held at the Academy of Sciences, USSR in Moscow (March 31 - April 7, 1955) and devoted to problems of quantum electrodynamics, theory of elementary particles and related fields of theorecical physics. Names of foreign scientists (mostly from behind the Iron curtain) attending the important conference are listed.

Institution : .....

Submitted : .....

BERESTETSKIY, V.B.

[illegible]

ANGULAR DISTRIBUTION OF π MESONS PRODUCED BY POLARIZED NUCLEONS. V. B. Berestetskii. Doklady Akad. Nauk S.S.S.R. 94, 421-3(1954) Jan. 21. (In Russian)

It is shown that the angular distribution of π mesons produced by polarized nucleons with low energy eventually maintains the interference from the S and P condition of the meson, reducing the characteristic azimuthal asymmetry. (J.S.R.)

3-1-55
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BERESTETSKIY, V. B.

USSR/Physics - Quantum electrodynamics

Card 1/1 : Pub. 118 - 7/9

Authors : Abrikosov, A. A.; Pomeranchuk, I. Ya.; and Shmushkevich, I. M.

Title : "Quantum Electrodynamics" by A. I. Akhizer and V. B. Berestetskiy. Gosizdat, 1953, 428 p.

Periodical : Usp. fiz. nauk 53/3, 442-444, July 1954

Abstract : A monographical work by two Soviet scientists is reviewed. The monograph deals with quantum electrodynamics and is considered to be a unique and very valuable work on theoretical physics.

Institution : ...

Submitted : ...

WILSON, J.G., editor; BERESTETSKIY, V.B. [translator]; TROITSKAYA, V.A. [translator]; LUKIRSKIY, P.I., akademik, redaktor; GUROV, K.P., redaktor; SHAPOVALOV, V.I., tekhnicheskiy redaktor.

[Progress in cosmic ray physics] Fizika kosmicheskikh luchei; sovremennye dostizheniia. Perevod s angliiskogo V.B.Berestetskogo i V.A. Troitskoi. Pod red. P.I.Lukirskogo. Moskva, Izd-vo inostrannoi lit-ry, 1954. 437 p.

(Cosmic rays) (Nuclear physics) (MLRA 7:12)

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BERESTETSKIY, V. B.

USSR/Nuclear Physics - Mesons, Tau 21 Sep 53

"Decay Into 3 pi-Mesons and the Hypothesis of Isotopic Invariance," V.B. Berestetskiy

DAN SSSR, Vol 92, No 3, pp 519-521

Analyzes previous works (Harding; Phil Mag 41 1950); Fowler et al, ibid 42 (1951); Hodson, ibid 42 (1951)) on known decay scheme of tau-meson into 2 positive and one negative pi-mesons and attempts to prove possibility of a tau-meson decay into 2 neutral and one positive meson. Indebted to Prof I.M. Gelfand and to Acad L.D. Landau, who also presented the article, 22 Jul 53.

268T86

BERESTETSKIY, V. B.

USSR/Physics - Quantum Electrodynamics, Perturbation — Feb 52

"Theory of Perturbations in Quantum Electrodynamics," V. B. Berestetskiy

"Uspekh Fiz Nauk" Vol XLVI, No 2, pp 231-278

Expounds the fundamentals and methods governing the theory of perturbations in modern quantum electrodynamics; does not, however, introduce any exposition of methods of regularization. Discusses collision matrices, general perturbation theory, energy of interaction, field of photons and electrons, 1st-order processes, function of interaction of 2 charges

210T101

USSR/Physics - Quantum Electrodynamics, Perturbation (Contd) — Feb 52

2d-order processes, examples, processes of higher order, and 2d approximations. Cites Ya. A. Smorodinskiy (ibid. 39, 325, 1949; G. A. Zisman, "Zhur Eksper i Teoret Fiz" 10, 1940 and 11, 1941. Also refers to non-Soviet sources: Schwinger; Dyson; Gupta; Feynman; Heitler; and symposium of non-Soviet articles translated into Russian.

210T101

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